

### REMARKS

These remarks are responsive to the Final Office Action, dated October 17, 2007.

Currently, claims 1-15 are pending with claims 1, 8 and 13 being independent. Claims 1 and 8-13 have been amended to expedite prosecution of this application to allowance and to overcome Examiner's objections.

#### 35 U.S.C. 103(a)

In the Final Office Action, the Examiner maintained his rejections of claims 1-4, 7, 8-12, and 13-14 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0049513 to Yakir (hereinafter, "Yakir") in view of U.S. Patent Publication No. 2002/0055972 to Weinman, Jr. (hereinafter, "Weinman"). In the Final Office Action, the Examiner stated that Yakir discloses all elements of claim 1 except that it does not "explicitly disclose 'wherein said repository nodes store a replica of said file.'" (Final Office Action, page 4). The Examiner stated that Weinman discloses this element. Applicants respectfully disagree and traverse this rejection.

Amended claim 1 recites, *inter alia*, receiving, at a destination fileserver, a set of stub files associated with the set of files, maintaining, at the destination fileserver, a list of repository nodes that contain a replica of each file in the set of files, and a list of files in the set of files stored at the destination fileserver, using the lists, initiating recovery of files in the set of files on the destination fileserver, using a stub file in the set of stub files, allowing access to a full content of a file associated with the stub file; replacing each stub file with a full content of the file associated with the stub file; and wherein said replacing includes receiving a client request for a specified file in the set of files; and replacing the stub file associated with the specified file with a full content of the specified file.

As understood by Applicants, Yakir relates to techniques for moving a stub file from an originating storage location to a destination storage location without recalling the migrated data corresponding to the stub files. (Yakir, Abstract). Further, Yakir discloses an advanced Historical Storage Management (“HSM”) based storage system that allows shares of data to be migrated from an originating server to a destination server. One of the drawbacks of Yakir is that it requires that both originating and destination file servers are present in order to migrate files. This is in contrast to the present invention that provides disaster recovery operation when originating file server is non-operational, failed and/or non-existent. Yakir cannot perform such task. Further, Yakir cannot replicate metadata across multiple volumes and, as such, it cannot perform HSM-assisted disaster recovery.

Further, Yakir and Wienman, as many other conventional HSM systems, is extremely slow in its file recovery efforts. The present invention allows faster recovery and access to files. Typically, in conventional systems, after a disaster or failure of a storage site, to allow access to files to users, an administrator would have to manually access and reload files that were previously stored at the failed storage site to a backup storage site. This process takes a lot of time and users cannot immediately access their files. This is contrary to the present invention that allows users through the use of stub files (4 Kb in size) to quickly access most needed files and while users are accessing the necessary files, the remaining files are being transferred to the backup site.

Yakir moves stub files from an originating storage location to a destination storage location without recalling migrated data corresponding to the stub file. (Yakir, para. [0009]). Yakir’s originating and destination storage locations can be on the same storage unit and assigned to the same or different file servers. (Yakir, para. [0009]). Yakir’s storage management

system (“SMS”) includes information that relates to location of files that were migrated (or re-migrated) and recalled. (Yakir, para. [0023]). The information can also include information related to storage policies, rules for storage environment, information related to various monitored storage units, information related to files stored in the storage environment, file location information that includes information used to find location of migrated data. (Yakir, para. [0023]). File location information can be replicated to databases on servers. (Yakir, para. [0023]).

However, in addition to failing to disclose “wherein the repository nodes store a replica of the file”, as recited in claim 1, Yakir also fails to disclose, *inter alia*, maintaining, at the destination fileserver, a list of repository nodes that contain a replica of each file in the set of files, and a list of files in the set of files stored at the destination fileserver, as recited in claim 1. In contrast, Yakir includes file location information using which Yakir’s SMS can find the file. Yakir does not maintain a list of repository nodes that have a replica of the file. Instead, Yakir stores “data locator information or portions thereof” in various storage locations. (Yakir, para. [0071]). The data locator information is stored in the stub file. (Yakir, para. [0071]). Clearly, this is different than maintaining a list of repository nodes that store replicas of a file. Further, Yakir fails to disclose, teach or suggest, *inter alia*, using the lists, initiating recovery of files in the set of files on the destination fileserver, using a stub file in the set of stub files, allowing access to a full content of a file associated with the stub file, as recited in claim 1. As such, Yakir fails to disclose, teach or suggest this element of claim 1.

Weinman does not cure the deficiencies of Yakir. As understood by Applicants, Weinman discloses a data dispersion method for reducing a risk of losing a file by replicating it across geographically-distant locations. (Weinman, paras. [0014]-[0016]). Upon creation of an

object, Weinman mirrors the object to n-1 additional mirror sites in the network. The number of copies may change upon creation of additional copies of disasters occurring in the additional sites. (Weinman, para. [0015]). Weinman also determines whether too few or too many copies have been created and either adds or deletes copies of files. (Weinman, para. [0015]). This is different than, *inter alia*, maintaining, at the destination fileserver, a list of repository nodes that contain a replica of each file in the set of files, and a list of files in the set of files stored at the destination fileserver, as recited in the amended claim 1. Weinman does not maintain any lists of nodes that have a replica of a file.

*Improper to Combine References*

There is no motivation or suggestion to combine Yakir and Weinman to produce the claimed invention. Yakir relates to migration of stub files from origination file server to the destination file server. Whereas, Weinman discloses a system for creating additional copies of files in geographically distant locations. Despite the Examiner's assertion that the two references are in the same field of endeavor, the two references and their respective technologies significantly differ from each other and provide no basis as to why they would be combined. Specifically, Yakir relates to moving of stub files and storage management, whereas Weinman relates to maintenance of a number of copies of files in a particular location. Neither Yakir, nor Weinman provide any suggestion or motivation as to why they should be combined. Thus, the only suggestion and/or motivation to combine Yakir and Weinman may be found in the present application, however, such suggestion/motivation cannot be relied upon in combining the reference. Hence, it is improper to combine Yakir and Weinman without some disclosed motivation other than the present application. See, MPEP 2143.01:

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of

the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.).

Even if one were to combine Yakir and Weinman, which would be improper, the present invention is not realized. Yakir relates to techniques for moving a stub file from an originating storage location to a destination storage location, where such techniques use data-locator information stored in the stub file. Weinman’s system creates multiple copies of actual files in various geographically-distant locations. The combination of Yakir and Weinman relates to a system for moving stub files from an originating storage location to a destination storage location and creating multiple copies of files in different locations. However, the combination of Yakir and Weinman fails to disclose, *inter alia*, maintaining, at the destination fileserver, a list of repository nodes that contain a replica of each file in the set of files, and a list of files in the set of files stored at the destination fileserver, as recited in claim 1.

As previously submitted in the response to the March 23, 2007 Office Action, Applicants would like to reiterate some of the advantages of the present invention over the convention systems as may be represented by some of the references cited by the Examiner. The arguments presented in the above response are incorporated herein by reference in their entirety and are repeated below.

An advantage of the present invention is that it allows for an accelerated fileserver disaster recovery process that can be used in any of the following exemplary instances: - when a fileserver fails, and the recovery server is at the same site as the failed fileserver;  
- when a fileserver is lost during a site disaster, and a remote fileserver is used as a recovery fileserver; and/or,

- when one or more shares on a fileserver need to be migrated to another fileserver in order to load-balance file access/performance across multiple file servers.

The present invention includes file servers that incorporate HSM technology in order to retain only the most active files on the more expensive disk storage within the file server tier of storage. In the present invention, a repository can be made up of servers that have lower cost disk storage technology. These repository servers maintain all of the backup history for all of the files created or modified on the file server(s). The latest historical version of the backup data in the repository for each fileserver file can also be leveraged to represent the staged-out copy of a file that has been deemed inactive by the filesystems' HSM policy. Inactive files on the file server can be "stubbed out" to reduce storage capacity consumption on the more costly file server disk subsystem, and these stub files can be pointed to the latest version of that file's backup data.

The present invention integrates file servers with integrated backup and HSM and enables a unique operational feature that is not possible with simple file servers, or HSM-only or backup-only systems. When a fileserver has completely failed (unrecoverable hardware failure or site disaster), the contents of that entire fileserver can be recreated from the backup data in the local or remote repository. In addition, because the file server incorporates HSM, the recovery of data to the recovery file server can be accelerated using an exemplary two-stage recovery operation:

Stage 1: re-populate the recovery file server with just HSM stub files. This reduces file server rebuild times from more than a day to less than an hour.

Stage 2: allow these stub files that are requested by users to be staged-in from the repository at high priority. In the absence of requests for files from users, all of the files that were cached in the fileserver that failed are re-cached on the recovery file server as a background task.

In contrast, Yakir does not address fileserver or site disaster recovery issues. Yakir migrates data from an operational originating server to an operational destination server for the purpose of load balancing. An advantage of the present invention is its use of HSM to accelerate the recreation of the content from a completely non-operational server (server failure, site disaster recovery) to a surviving server. As such, Yakir does not address the same issues as the present invention.

Further, Yakir does not stage-in content during a file server migration, thus, after server migration, the destination server has all of its data stubbed out. This is undesirable from an end-user access-time perspective, because access to each file is a time-consuming stage-in process. In contrast, the present invention, after disaster recovery, allows end-users to access full data, originally present at a failed originating server, at a surviving destination server. The present invention is able to track a cached state of files at the originating server and stages-in these files automatically at the destination server to accelerate future access to frequently used files by end-users. This automatic reloading of cached data is not disclosed in either Yakir or Weinman.

Further, Weinman's system is a distributed web content management system that distributes copies geographically in order to provide high resiliency to site disaster. Whereas, the present invention relates to a primary storage system that is accessed directly by end-users that create, modify and delete files over time. In Weinman, end-users cannot access these files directly. Weinman is a simple replication of a current content. In contrast, the present invention provides complete historical backup of data.

As such, claim 1 is not rendered obvious by the combination of Yakir and Weinman. Thus, this rejection is respectfully traversed. The Examiner is requested to reconsider and withdraw his rejection of claim 1.

Claims 8 and 13 are patentable over the Yakir and Weinman combination for at least the reasons stated above with regard to claim 1. As such, the rejection of claims 8 and 13 is respectfully traversed. The Examiner is requested to reconsider and withdraw his rejection of claims 8 and 13.

Claims 2-7, 9-12 and 14-15 are dependent on the independent claims 1, 8, and 13, respectively. As such, claims 2-7, 9-12 and 14-15 are patentable over the combination of Yakir and Weinman for at least the reasons stated above with respect to claim 1. Hence, the rejection of claims 2-7, 9-12 and 14-15 is respectfully traversed. The Examiner is requested to reconsider and withdraw his rejection of claims 2-7, 9-12 and 14-15.

In the March 23, 2007 Office Action, the Examiner rejected claims 5, 6, and 15 under 35 U.S.C. 103(a) as being unpatentable over Yakir, Weinman, and U.S. Patent No. 5,564,037 to Lam (hereinafter, "Lam"). This rejection is respectfully traversed.

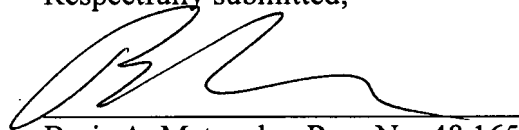
Claims 5, 6, and 15 are dependent on the independent claims 1 and 13. As stated above, these claims are patentable over the combination of Yakir and Weinman for at least the reasons stated above with regard to claim 1. Lam does not cure the deficiencies of the combination of Yakir and Weinman. Lam relates to staging out files that have not been accessed in some time from primary storage to secondary and tertiary storage. However, Lam fails to disclose, teach or suggest, *inter alia*, maintaining, at the destination fileserver, a list of repository nodes that contain a replica of each file in the set of files, and a list of files in the set of files stored at the destination fileserver, as recited in claim 1. As such, the combination of Yakir, Weinman, and Lam fails to render claims 5, 6, and 15 obvious. Thus, this rejection is respectfully traversed. The Examiner is requested to reconsider and withdraw his rejection of claims 5, 6, and 15.



No new matter has been added. The claims currently presented are proper and definite. Allowance is accordingly in order and respectfully requested. However, should the Examiner deem that further clarification of the record is in order, we invite a telephone call to the Applicants' undersigned attorney to expedite further processing of the application to allowance.

Applicants believe that no additional fees are due with the filing of this Amendment. However, if any additional fees are required or if any funds are due, the USPTO is authorized to charge or credit Deposit Account Number: 50-0311, Customer Number: 35437, Reference Number: 25452-015.

Respectfully submitted,



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